TANK REMOVAL SUMMARY
FOR CFA-680

1.0 INTRODUCTION

The EG&G Idaho, Inc. (EG&G Idaho) Tank Management Program (TMP) is responsible for the removal of out-of-service Underground Storage Tanks (USTs) throughout the Department of Energy's Idaho National Engineering Laboratory (INEL) to meet requirements set forth in 40 CFR 280 Subparts F and G (40 CFR, 1990). The following is a removal summary for a UST designated as CFA-680, located at the Central Facility Area (CFA). The UST CFA-680 was removed on October, 16, 1990.

Information obtained from current inventory records, historical tank use records, and sampling and laboratory analytical results is being presented here to assess activities to date for CFA-680.

2.0 TANK HISTORY AND PURPOSE

From the current TMP inventory database records, the tank content of CFA-680 was leaded gasoline. The analytical results are contained in the CFA-680 Tank file in the custody of the TMP. Based on tank historical records, CFA-680 was a 55 gallon steel UST which stored gasoline used for a water pump. This tank was installed in 1951 and remained in use until 1983. Based on the age of the tank, it is assumed that it stored leaded gasoline. CFA-680 was located next to CFA-606 east of the CFA cafeteria (Figure 1). A Ground Penetration Radar Survey map of CFA-680 is presented in Attachment A.

A liquid sample of the tank contents was collected on May 22, 1989 for waste profile analysis. The sample logbook provides a description of the sample at the time of collection (Attachment B). The analytical work was performed by EG&G Idaho's Environmental Chemistry Unit. The Generator's Hazardous Waste Material Profile Sheets (EG&G Form 669) are completed for all USTs and are part of the record keeping system for the TMP. Form 669s are not required for

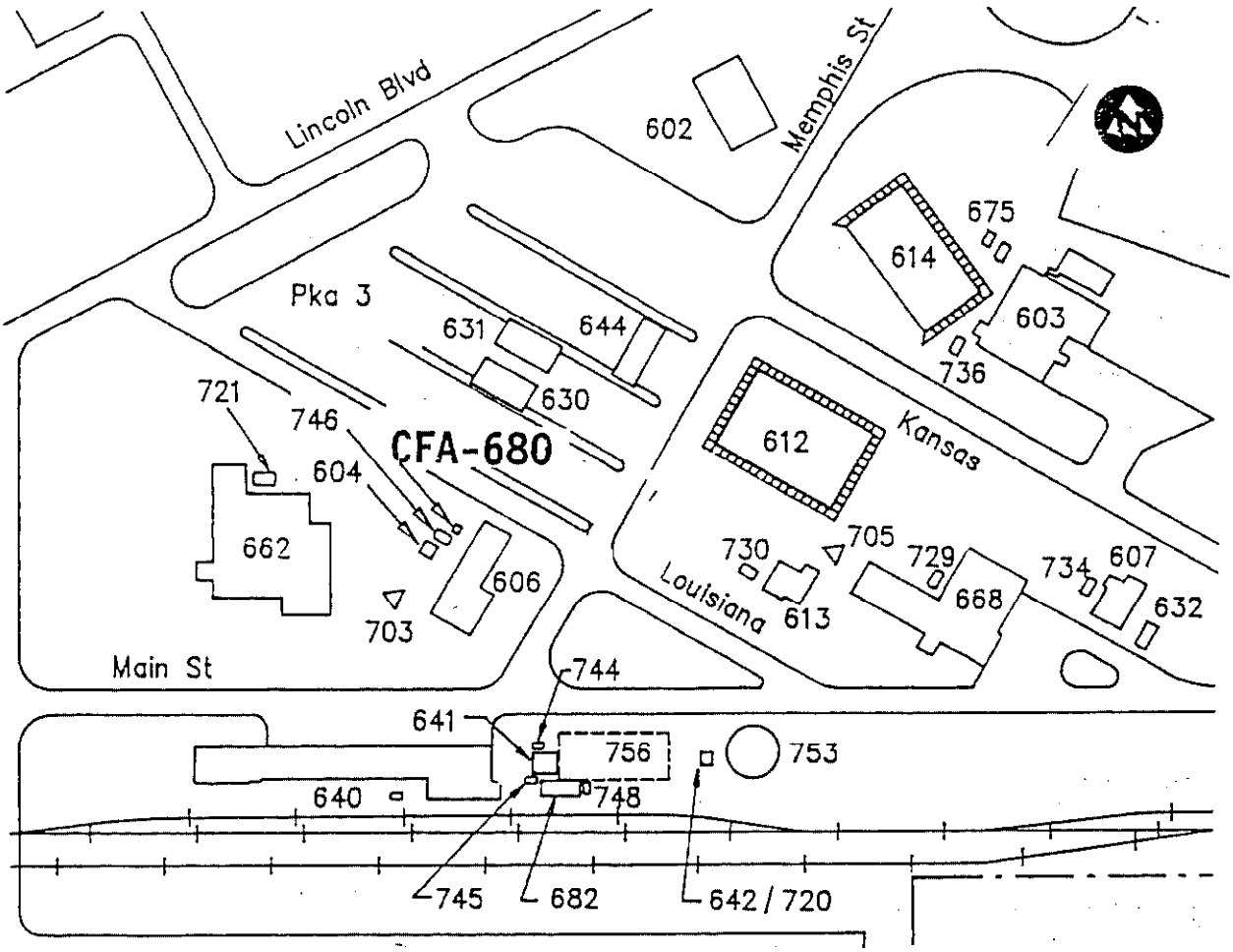


Figure 1. Location of CFA-680.

petroleum tank contents; however, Form 669s have been completed and submitted to the EG&G Waste Handling Operations (WHO) Unit for waste characterization (Attachment C). This data is only used as a means of transmitting information to the WHO Unit. According to the analytical results, the contents of CFA-680 contained leaded gasoline. The reports of analysis describing the material is consistent with those constituents that are typically found in leaded gasoline. The analytical results did not reveal the presence of any hazardous characteristics for the sample analyzed from the CFA-680 Tank. After reviewing the analytical reports of analysis (ROA) submitted along with the Form 669s, the WHO concluded that ROA describing the material was consistent with those constituents that are typically found in leaded gasoline, and this product should be recycled as a fuel to be burned for energy recovery. A fuel that is recycled by burning for energy recovery is exempted from classification as a solid waste and therefore can not be classified as a hazardous waste (G. Andrews, 1990). On August 21, 1990 , approximately 55 gallons of product were pumped from CFA-680 by H & M Oil, Pocatello, Idaho to be used for fuel recovery.

3.0 TANK REMOVAL

Excavation and removal activities for the CFA-680 tank were accomplished on October 16, 1990. For safety and sampling purposes, volatile organic compound (VOC) levels in the tank excavation and excavated soils were monitored by the EG&G Environmental Technology Unit staff using a Photovac Microtip Photoionization Detector (PID). Field screening involved the use of visual observation of excavated materials for discoloration and the use of the PID to evaluate the presence of VOCs (EG&G Idaho, 1990). Field screening methods helped determine the location and frequency of samples collected for laboratory analysis. Samples for field screening were collected with a decontaminated stainless steel soil spoon and placed in a ziplock soil sampling bag before analysis with the precalibrated Microtip PID (EG&G Idaho, 1990). The portable Microtip PID was calibrated daily before sample collection (EG&G Idaho, 1990).

Soil samples were screened with the Microtip PID as the soil was being removed. During the excavation, VOCs were detected in the soil by the Microtip PID. However, as shown in Table 1, all of the soil tested during the excavation

was below the field screening action level of 25 ppm Microtip PID reading for gasoline (EG&G, 1990). Soil above this action level would have been considered contaminated and would have been separated from the clean soil and transported to the INEL Central Facility Area (CFA) Landfill.

Following excavation, the pit was backfilled with the clean soil that was removed and with additional clean soil from the gravel pit at the INEL CFA area. Once the process of backfilling was completed, CFA-680 was moved to the tank storage yard at CFA at the direction of the Job Site Supervisor.

Table 1. Microtip PID VOC field screening results for samples collected in the CFA-680 excavation

Location Number*	Concentration (ppm)
0 (UC30001T2)	2.8 ppm
1 (UC30101T2)	2.9 ppm
2 (UC30201T2)	6.3 ppm
2 (UC30202T2) Duplicate	7.0 ppm
3 (UC30301T2)	4.7 ppm
4 (UC30401T2)	5.3 ppm

*Collocated with samples with the same number in Table 2.

4.0 SOIL SAMPLE SUMMARY

Five biased soil samples were collected from the tank excavation before backfilling. Soil sample locations were biasly selected to ares with the highest potential for contamination from tank product. The sample locations included areas directly below materials that were detectably contaminated and removed. Sample locations along the tank keel line and at points along the outer edge of the tank were also selected. Soil samples were collected directly from the heavy equipment bucket. A decontaminated stainless steel soil spoon was used to completely fill a 250-mL glass I-CHEM jar. Soil samples collected underneath CFA-680 were sent to Data Chem Laboratories in

Salt Lake City, Utah, a CLP laboratory, for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX) using EPA Method SW-846-8020. The samples were also analyzed for Total Petroleum Hydrocarbons (TPH) using EPA Method SW-846-8015 (EPA, 1986). Approximate soil sample locations are identified in the sample logbook (Attachment D). All soil samples submitted to Data Chem were taken at a uniform depth of 5 ft. A summary of the analytical results (given in Attachment E) is shown in Table 2.

Quality control sampling for petroleum USTs was limited to one field replicate per tank closure. This decision was based upon the range of action levels used for contamination status. Rinsate and trip blanks would have little significance for petroleum contaminated samples that have action levels of 100 ppm for gasoline and 1000 ppm for diesel (EG&G Idaho, 1990).

5.0 AREA ASSESSMENT

The assessment of the CFA-680 area after tank removal was based upon the presence and extent of contaminants in the soil associated with the tank. Contaminant concentrations in the soil were compared to action levels as per agreement with EPA Region X and the Idaho Department of Health and Welfare, Division of Environmental Quality (IDH&W-DEQ) (EG&G Idaho, 1990).

Laboratory analysis action levels are commonly set at 100 ppm BTEX and TPH for materials associated with gasoline tanks (State of California Leaking Underground Fuel Tank Task Force, 1988). The TMP has set a more conservative action level of 80 ppm gasoline, which is 20% below the laboratory action level, for materials associated with gasoline.

During removal activities, all of the excavation materials appeared to be below the set field action levels as evidenced by the VOC readings on the Microtip PID. Laboratory analytical results confirmed the non-contaminated status for all soils. The pit was backfilled on the same day as the tank removal, as directed by the Job Site Supervisor.

Table 2. Laboratory analytical results for soil samples collected from the CFA-680 excavation[a]

Field Sample Number	Datachem Lab Number	Sample Type	Sample Description	Benzene (μg/g)	Ethyl Benzene (μg/g)	Toluene (μg/g)	Xylene (μg/g)	Total Petroleum Hydrocarbons (μg/g)
UC30001T2	EJ 5621	SOIL	excavation	ND*	ND*	ND*	ND*	ND*
UC30101T2	EJ 5622	SOIL	excavation	ND*	ND*	ND*	ND*	ND*
UC30201T2	EJ 5623	SOIL	excavation	ND*	ND*	ND*	ND*	ND*
UC30202T2	EJ 5624	SOIL	duplicate	ND*	ND*	ND*	ND*	ND*
UC30301T2	EJ 5625	SOIL	excavation	ND*	ND*	ND*	ND*	ND*
UC30401T2	EJ 5626	SOIL	excavation	ND*	ND*	ND*	ND*	ND*
Limit of Detection				0.05	0.05	0.05	0.1	10.0
Action Level (ppm)				80	80	80	80	80

a. The data presented above have not yet been validated, but a validation review will be performed at a later date.

ND Parameter not detected

Based on our review of the field readings and CLP analytical data, the CFA-680 Tank site is currently considered by the TMP to have contamination levels below the set TMP action levels of 80 ppm for TPH and BTEX. However, the CLP analytical data have not been validated at this time, and a data validation review will be performed by the EG&G Idaho Sample Management Office at a later date. The closure status of the tank may change if the data prove invalid.

REFERENCES

G. Andrews Notegram to M. Gitt, 1990, Underground Storage Tanks, August 9.

EG&G Idaho (EG&G Idaho, Inc.), 1990, *Sampling and Analysis Plan for Site Assessment During the Closure or Replacement of Nonradioactive Underground Storage Tanks*, EGG-ESQ-9116, August.

EPA (U.S. Environmental Protection Agency), 1986, *Test Methods for Evaluating Solid Waste, Physical Chemical Methods*, 3rd Ed., SW-846.

State of California Leaking Underground Fuel Tank Task Force, 1988, *Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure*, May.

TANK REMOVAL SUMMARY
FOR CFA-680

Prepared by:

K. M. Ludi
Environmental Technology Unit

2-26-91
Date

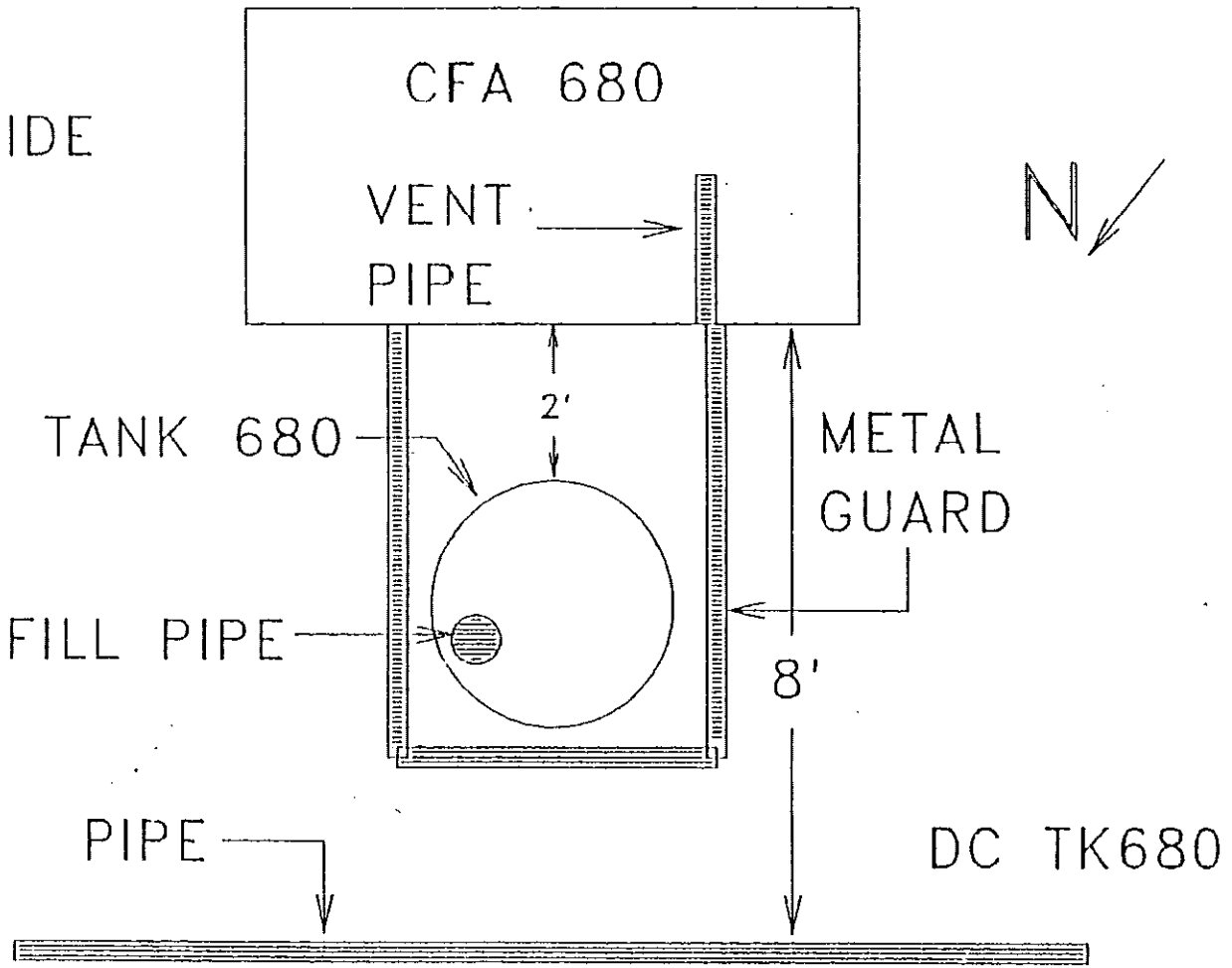
Reviewed by:

M. A. Knecht
Unit Manager, Environmental Technology

2-25-91
Date

ATTACHMENT A
GROUND PENETRATION RADAR SURVEY MAP

NOTE! TANK INSIDE
MANHOLE COVER
3 FT. DEEP



ATTACHMENT B
FIELD LOGSHEET

FIELD LOGSHEET

Pg 1 of 1

Date (dd/mmm/yy): 22/MAY/89

Sample Team Members:

P. Permann

L. Wallace

D. Rhoades

Visitors/Organization

Parley Williams (IH)

Narrative (include time and location): CFA680

0830 - Arrive - Parley takes LEL reading - Liquid is drawn up into LEL tube - reads 25%.

0840 Dusty returns from surveying tanks with HP.

0850 - Take level measurement - Tank feels like it has some sludge in the bottom - DIRT shows up on dip stick.

0900 - Take samples CFA680LL01 and CFA680LL02.

0910 - Move SITES

Orange liquid with some dark sludge and water on bottom. Tubing taped to end of dipstick with duct Tape.

* All tanks surveyed by HP previous to commencing sampling for 5/22/89.

Recorded by: PJ Permann Checked by: Linda Wallace

Sample Log Sheet

Tank ID No. CFA 680 Date (dd/mmm/yy) 22/MAY/83
Tank Owner (Name and Number) Dale Lainhart Time: 09:00
Tank Capacity and Dimensions _____

Description of Sample Location (including access port diameter): North side of Bldg 680 - inside cement manhole

Type of Waste (suspected) Gasoline

Collection Technique:

(✓) peristaltic pump ( ) coliwassa
( ) bacon bomb ( ) other _____

Description of Sample: Yellowish orange - contains some darker material on bottom mixed with oil

( ) composite (✓) grab Sample depth below surface _____ in.

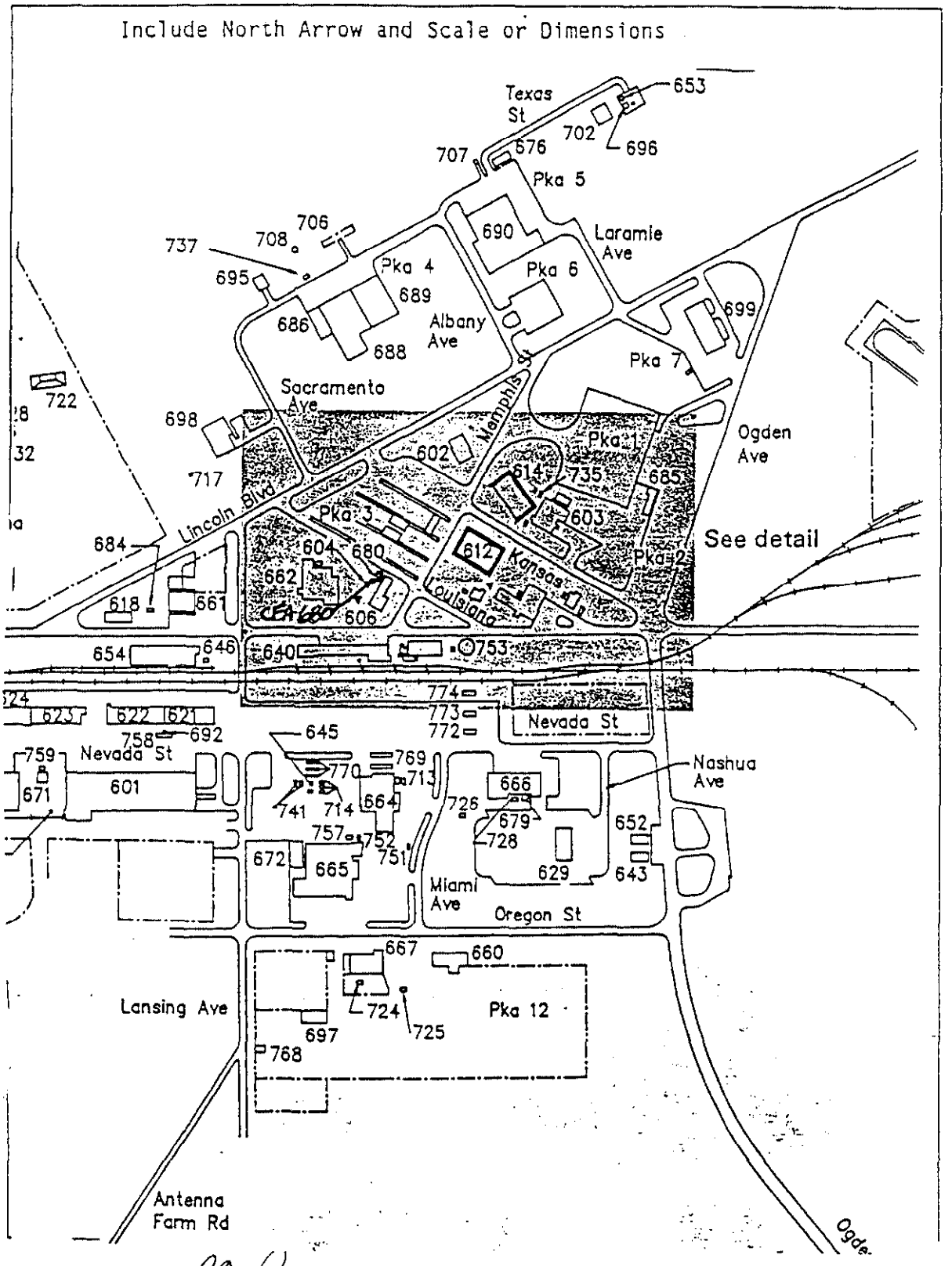
Field Measurements:	Reading	Units (if applicable)
HNU		
LEL Meter	25%	
Radioactivity	Bkgrd.	
Background Radioactivity		
Other: _____		
_____		

Sludge Depth _____ in. Liquid Level Depth 14 in.

Field Observations (include weather observations): Sunny, Calm

Recorded by: PJ Remann Checked by: Linda Wallace

FIELD SKETCH OF TANK LOCATION



Recorded by: PJ Hermann Checked By: _____

ATTACHMENT C
GENERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET
(FORM 669)

EG&G Idaho Inc
FORM EG&G 669
(Rev. 06-87)

GENERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET

Waste Profile Sheet Code

Facility:

A. General Information

Generator Name:

Charge No.

y Address:

Organization No.

Technical Contact: Title: Phone:

Name of Waste:

Process Generating Waste:

B. Physical Characteristics of Waste

Color

Physical state @ 70°F
- ☐ Solid
- ☑ Liquid
- ☐ Semi-solid
- ☐ Powder

Layers
- ☐ Multilayered
- ☐ Bi-layered
- ☒ Single phased

Free Liquids
- ☐ Yes ☐ No
- Volume ____ %

pH:
- ☐ < 2
- ☐ 2—4
- ☐ 4.1—6.9
- ☐ 7
- ☐ 7.1—10
- ☐ 10.1—12.5
- ☐ > 12.5
- ☐ Exact ____

Specific Gravity
- ☐ 0.8
- ☐ 0.8—1.0
- ☐ 1.1—1.2
- ☐ 1.3—1.4
- ☐ 1.5—1.7
- ☐ > 1.7
- ☒ Exact

Flash Point
- ☐ 70°F
- ☐ 70°F—100°F
- ☐ 101°F—139°F
- ☐ 140°F—200°F
- ☐ No Flash
- ☐ > 200°F
- ☒ Exact

- ☑ Closed Cup
- ☐ Open Cup

C. Incineration Information

____ Btus
Heat of Combustion

____ %
Ash Content

____ %
Halogen Content

D. Chemical Composition (Totals must add to 100% or attach analysis sheet)

	%
	%
	%
	%
	%
	%
	%
	%
	%
	%

E. Metals ☐ Total (ppm) ☒ EPA Extraction Procedure (mg/L)

Arsenic (As)		Selenium (Se)	
Barium (Ba)		Silver (Ag)	
Cadmium (Cd)		Copper (Cu)	
Chromium (Cr)		Nickel (Ni)	
Mercury (Hg)		Zinc (Zn)	
Lead (Pb)		Thallium (Tl)	
Chromium-Hex (Cr+6)			

F.

PCB ____ ppm

☐ Oil ☐ Transformers ☐ Capacitors ☐ Debris

G. Reactivity Characteristics: ☐ None

☐ Pyrophoric ☐ Shock-sensitive ☐ Water-reactive

☐ Explosive ☐ Chemically unstable ☐ Cyanide or sulfides

H. ☐ New waste stream

If new stream, provide representative sample in one-liter (quart) glass or plastic container.

☐ Sample sent.

I. Present volume to be shipped to HWSF

____ Drums

____ Gallons

____ Pounds

J. ____ Anticipated volume per year.

☐ Drums ☐ Cu. feet

☐ Gallons ☐ Cu. yards

☐ Pounds ☐ Tons

K. ☐ Radioactive

☒ Nonradioactive

If radioactive, attach spectral analysis.

☐ Spectral analysis attached.

Principal Nuclide(s):	Activity (Ci):

Total Activity: ____ Ci

Specific Activity: ____ Ci/g

L. Special handling, procedures, comments:

I hereby certify that all information submitted in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed.

Authorized Signature | Title | Date

Copies 1 & 2 — Waste Management Copy 3 — Generator Retain

EG&G Idaho Inc
FORM EG&G 669
(Rev. 08-87)

NERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET

Waste Profile Sheet Code

Facility:

A. General Information

Generator Name: Lockheed ... (INCE-TA) Charge No.

Address: INEL Organization No.

P.O. Box 1625

Idaho Falls Idaho 83415

Technical Contact: Mike Nolan Title: Eng. & Proj. Phone: 526-8232

Name of Waste: Mixed Low Level Waste

Process Generating Waste: Tank Farm Program

B. Physical Characteristics of Waste

Color

Physical state @ 70°F
- ☐ Solid
- ☒ Liquid
- ☐ Semi-solid
- ☐ Powder

Layers
- ☐ Multilayered
- ☐ Bi-layered
- ☒ Single phased

Free Liquids
- ☐ Yes ☐ No
- Volume ____ %

pH:
- ☐ <2
- ☐ 2—4
- ☐ 4.1—6.9
- ☐ 7
- ☐ 7.1—10 ☒ N/A
- ☐ 10.1—12.5
- ☐ >12.5
- ☐ Exact ____

Specific Gravity
- ☐ 0.8
- ☐ 0.8—1.0
- ☐ 1.1—1.2
- ☐ 1.3—1.4
- ☐ 1.5—1.7
- ☐ >1.7
- ☐ Exact 1.22 (est)

Flash Point
- ☐ 70°F
- ☐ 70°F—100°F
- ☐ 101°F—139°F
- ☐ 140°F—200°F
- ☐ No Flash
- ☐ >200°F
- ☐ Exact 93°C
- ☒ Closed Cup
- ☐ Open Cup

C. Incineration Information

Not Analyzed

____ Btus Heat of Combustion

____ % Ash Content

____ % Halogen Content

D. Chemical Composition (Totals must add to 100% or attach analysis sheet)

Water	99+ %
	%
	%
	%
	%
	%
	%
	%
	%
	%

E. Metals ☐ Total (ppm) ☒ EPA Extraction Procedure (mg/L)

Arsenic (As)	<.05	Selenium (Se)	<.05
Barium (Ba)	2.5	Silver (Ag)	<.1
Cadmium (Cd)	<.01	Copper (Cu)	<.01
Chromium (Cr)	<.01	Nickel (Ni)	<.02
Mercury (Hg)	<.0002	Zinc (Zn)	0.135
Lead (Pb)	.057	Thallium (Tl)	<.05
Chromium-Hex (Cr+6)	1.4		

F.

PCB Not Analyzed ppm

☐ Oil ☐ Transformers ☐ Capacitors ☐ Debris

G. Reactivity Characteristics: ☐ None Not Analyzed

☐ Pyrophoric ☐ Shock-sensitive ☐ Water-reactive

☐ Explosive ☐ Chemically unstable ☐ Cyanide or sulfides

H. ☐ New waste stream

If new stream, provide representative sample in one-liter (quart) glass or plastic container.

☐ Sample sent.

I. Present volume to be shipped to HWSF

____ Drums

____ Gallons

____ Pounds

J. ____ Anticipated volume per year.

☐ Drums ☐ Cu. feet

☐ Gallons ☐ Cu. yards

☐ Pounds ☐ Tons

K. ☐ Radioactive

☒ Nonradioactive

If radioactive, attach spectral analysis.

☐ Spectral analysis attached.

Principal Nuclide(s):	Activity (Ci):

Total Activity: ____ Ci

Specific Activity: ____ Ci/g

L. Special handling, procedures, comments:

The waste exhibits / contains trace levels of 2-methylnaphthalene, anthracene, chrysene, fluorene, naphthalene, phenanthrene, pyrene, benzene, toluene and xylene (reactive)

I hereby certify that all information submitted in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed.

Authorized Signature	Title	Date
		7-26-89

Copies 1 & 2 — Waste Management Copy 3 — Generator Retain

Idaho National Engineering Laboratory

EG&G Idaho, Inc.
Environmental Chemistry Unit
P.O. Box 1625, MS 4123
Idaho Falls, ID 83415

This report of analysis (ROA) presents the analytical results for the analyses you requested. Sample identification, sampling information, and laboratory analysis information are listed in a column for each sample. Analytical results are listed by analytical parameter below the sample identification information. Acronyms and abbreviations used are defined at the end of the report. A letter and/or letter number flag immediately to the right of a parameter, method, PQL and units, result, or any other entry indicates an amplifying comment also provided at the end of the report.

REPORT OF ANALYSIS
INEL Tank Closure Program

Prepared for:

Michael J. Nolan
Tank Closure Program Manager
Environmental Restoration Program
EG&G Idaho, Inc.
P.O. Box 1625, MS 8105
Idaho Falls, ID 83415

Report Identification:

ROA Number: 890073-I
Date: 06/26/90
Charge No.: 3RIF08400

Analysis Results Summary for Tank CFA 680

Cancellation:
-ROA 890073-F, 06/07/90

This report provides results for the following:
-Ignitability
-Total metals
-Toxicity Extraction Procedure (EP) and metal analyses of the extract. Results reported in this ROA supercede those reported on 06/07/90, ROA 890073-F and 890073-C, 04/11/90. An error in data reduction caused the reported EP Toxicity metals concentrations for the sample to be understated by a factor of 1000. (Values reported for ignitability and total metals are unchanged from the previous report.)

Summary:

EP Toxicity - The sample does exhibit the characteristics of EP Toxicity for metals.

Total metals results are normally reported in units of mg/kg for nonaqueous liquids, so total concentrations were multiplied by the liquid phase density to convert to units of ug/L for comparison to the EP Toxicity regulatory limits.

Several analytes have a reported < value (the sample specific PQL), which indicates that the analytes were not detected in this sample at levels exceeding the PQLs. The listed values are near to or exceed the maximum regulatory limits for the analytes; however, since the analytes were not detected in the total metals analysis, it is unlikely that the actual sample concentrations would exceed the regulatory limits.

Ignitability - Sample CFA680LL01 does exhibit the hazardous characteristic of Ignitability.

EG&G Idaho, Environmental Chemistry, ROA 890073-I

Pag.

Sampling Site:		CFA
Tank ID:		CFA 680
Sample Type:	Blank	Liquid
Customer Sample ID:		CFA680LL01
Sampling Date:		05/22/89
Date Received:		05/22/89
Lab Sample ID:	PB	9MIA0903
Date Digested:	02/17/90	02/17/90
Date Analyzed:	03/02/90	03/02/90
Mercury Date Digested:	03/07/90	03/07/90
Mercury Date Analyzed:	03/09/90	03/09/90
Remarks:	Lab Blank	

Parameter	Method	PQL and Units	Result	Result
Metals AA - ICP				Comment M15
Arsenic	EPA SW-846 6010	25.0 mg/kg	< 25.0	< 24.4
Barium	EPA SW-846 6010	20.0 mg/kg	< 20.0	< 19.5 S6
Cadmium	EPA SW-846 6010	0.50 mg/kg	< 0.50	< 0.49
Chromium	EPA SW-846 6010	1.0 mg/kg	< 1.0	< 0.98
Copper	EPA SW-846 6010	2.5 mg/kg	< 2.5	< 2.4
[illegible]	EPA SW-846 6010	15.0 mg/kg	< 15.0	70.8 S6
Mercury	EPA SW-846 7470	0.020 mg/kg	< 0.020	< 0.020
Nickel	EPA SW-846 6010	4.0 mg/kg	< 4.0	< 3.9
Selenium	EPA SW-846 6010	30.0 mg/kg	< 30.0	< 29.3
Silver	EPA SW-846 6010	1.0 mg/kg	< 1.0	< 0.98
Thallium	EPA SW-846 6010	50.0 mg/kg	< 50.0	< 48.8
Zinc	EPA SW-846 6010	2.0 mg/kg	79.0	16.9 B

EG&G Idaho, Environmental Chemistry, ROA 890073-I

Page

Sampling Site:	CFA
Tank ID:	CFA 680
Sample Type:	Liquid
Customer Sample ID:	CFA680LL01
Sampling Date:	05/22/89
Date Received:	05/22/89
Lab Sample ID:	9MIA0903
Date Digested:	02/17/90
Date Analyzed:	03/02/90
Mercury Date Digested:	03/07/90
Mercury Date Analyzed:	03/09/90
Remarks:	

Hazardous Waste Characterization as prescribed by Resource Conservation and Recovery Act (PL 94-580)

Parameter	Method	Units	Result		Regulatory Definition (comment RD2)
EP Toxicity	EPA SW-846 1310		Comments EP8,EP9,EP10		
Metals AA-ICP					(max. conc.)
Arsenic	EPA SW-846 6010	ug/L	< 19900		5000
Barium	EPA SW-846 6010	ug/L	< 15900		100000
Cadmium	EPA SW-846 6010	ug/L	< 400		1000
omium, Total	EPA SW-846 6010	ug/L	< 800		5000
Lead	EPA SW-846 6010	ug/L	57700	EP9	5000
Mercury	EPA SW-846 7470	ug/L	< 16.0		200
Selenium	EPA SW-846 6010	ug/L	< 23900		1000
Silver	EPA SW-846 6010	ug/L	< 800		5000
Organic Compounds in Extract	NA				
Corrosivity (pH)	NA				
Ignitability	EPA SW-846 1010	20 C	23 C	HI1	(min. temp.) 60
Reactivity	NA				

Legend:

BPQL = Below practical quantitation level. See PQL definition for further explanation of practical quantitation level.

NA = Not Analyzed.

PQL = Practical quantitation level. This is the lowest concentration reliably measurable (i.e., 33% maximum uncertainty in precision and accuracy at the one standard deviation confidence level) for normal samples during routine laboratory operations.

< = Less than. The value reported immediately following the less than symbol is the practical quantitation level (PQL) for the analyte. See the PQL definition for further explanation of the PQL. The reported PQL is adjusted for differences in sample weight, sample volume, sample moisture content, and analysis dilutions whenever those parameters differ from that specified for the standard analytical procedure.

Comments:

B The presence of this element/compound in the associated laboratory method blank indicates the analyte found in the sample may be partially or completely a result of laboratory contamination.

EP8 The reported < value (the sample specific PQL) indicates that the analyte was not detected in this sample phase at levels exceeding the PQL. The listed value is near to or exceeds the maximum regulatory limit; however, since the analyte was not detected in the total metals analysis, it is unlikely that the actual sample concentration would exceed the regulatory limit.

EP9 The sample does exhibit the characteristics of EP Toxicity for metals for this phase (i.e., metal concentrations exceed the regulatory maximum concentration).

10 Total metals results are normally reported in units of mg/kg for nonaqueous liquids, so total concentrations were multiplied by the liquid phase density to convert to units of ug/L for comparison comparison to the EP Toxicity regulatory limits.

HI1 The sample does exhibit the hazardous characteristic of Ignitability.

EG&G Idaho, Inc.
Environmental Chemistry
P.O. Box 1625, MS 4123
Idaho Falls, ID 83415

This report of analysis (ROA) presents the analytical results for the analyses you requested. Sample identification, sampling information, and laboratory analysis information are listed in a column for each sample. Analytical results are listed by analytical parameter below the sample identification information. Acronyms, abbreviations, and symbols used are defined at the end of the report. A letter and/or letter number flag immediately to the right of a parameter, method, PQL and units, result, or any other entry indicates an amplifying comment also provided at the end of the report.

REPORT OF ANALYSIS
INEL Tank Closure Program

Prepared for:

W.A. Rhoades
Tank Closure Program Manager
Environmental Restoration Program
EG&G Idaho, Inc.
P.O. Box 1625, MS 8101
Idaho Falls, ID 83415

Report Identification:

ROA Number:	268
Date:	01/05/90
Charge No.:	3RIF08400
Page:	1

Analysis Results Summary for Tank CFA 680

This report provides results for the following:

- -Volatile Organic Compounds
- -Semivolatile Organic Compounds

Due to the sample matrix (a liquid with numerous particles), the aliquots analyzed for Volatile Organic Compounds and Semivolatile Organic Compounds were measured gravimetrically rather than volumetrically. For this reason, the concentrations are reported in ug/kg, rather than ug/L. The concentrations in terms of ug/L would be slightly higher than the ug/kg reported.

Customer Sample ID:	LAB BLANK	CFA680LL01				
Sample Type:		Liquid				
Date Sampled:	/ /	05/22/89				
Date Received:	/ /	05/22/89				
Lab Sample ID:	S8LK0903	9MIA0903				
Date Extracted:	11/09/89	11/09/89				
Date Analyzed:	12/07/89	12/07/89				

Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Semi-volatile Organic Compounds EPA Method 8270						
1,2,4,5-Tetrachlorobenzene	< 9900	< 99000				
1,2,4-Trichlorobenzene	< 9900	< 99000				
1,2-Dichlorobenzene	< 9900	< 99000				
1,3-Dichlorobenzene	< 9900	< 99000				
1,4-Dichlorobenzene	< 9900	< 99000				
1-Chloronaphthalene	< 9900	< 99000				
1-Naphthylamine	< 9900	< 99000				
2,3,4,6-Tetrachlorophenol	< 9900	< 99000				
2,4,5-Trichlorophenol	< 9900	< 99000				
2,4,6-Trichlorophenol	< 9900	< 99000				
2,4-Dichlorophenol	< 9900	< 99000				
2,4-Dimethylphenol	< 9900	< 99000				
2,4-Dinitrophenol	< 49500	< 495000				
2,4-Dinitrotoluene	< 9900	< 99000				
2,6-Dinitrotoluene	< 9900	< 99000				
2-C[illegible]naphthalene	< 9900	< 99000				
2-[illegible]phenol	< 9900	< 99000				
2-Me[illegible]ylnaphthalene	< 9900	2905375				
2-Methylphenol	< 9900	< 99000				
2-Naphthylamine	< 9900	< 99000				
2-Nitroaniline	< 49500	< 495000				
2-Nitrophenol	< 9900	< 99000				
2-Picoline	< 49500	< 495000				
3,3'-Dichlorobenzidine	< 19500	< 195000				
3-Methylcholanthrene	< 9900	< 99000				
3-Nitroaniline	< 49500	< 495000				
4,6-Dinitro-2-methyl phenol	< 49500	< 495000				
4-Aminobiphenyl	< 19500	< 195000				
4-Bromophenyl phenyl ether	< 9900	< 99000				
4-Chloro-3-methylphenol	< 19500	< 195000				
4-Chloroaniline	< 19500	< 195000				
4-Chlorophenyl phenyl ether	< 9900	< 99000				
4-Methylphenol	< 9900	< 99000				
4-Nitroaniline	< 49500	< 495000				
4-Nitrophenol	< 49500	< 495000				
7,12-Dimethylbenz(A)anthracene	< 9900	< 99000				
A,A-Dimethylphenethylamine	< 19500	< 195000				
Acenaphthene	< 9900	< 99000				
Acenaphthylene	< 9900	< 99000				
Acetophenone	< 9900	< 99000				
Aldrin	< 19500	< 195000				

Customer Sample ID: LAB BLANK CFA680LL01

Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Semi-volatile Organic Compounds EPA Method 8270						
Alpha-BHC	< 19500	< 195000				
Alpha-endosulfan	< 19500	< 195000				
Aniline	< 9900	< 99000				
Anthracene	< 9900	< 99000				
BIS(2-Chloroethoxy)methane	< 9900	< 99000				
BIS(2-Chloroethyl) Ether	< 9900	< 99000				
BIS(2-Chloroisopropyl)ether	< 9900	< 99000				
BIS(2-ethylhexyl)phthalate	41535	< 99000				
Benzidine	< 49500	< 495000				
Benzo(G,H,I)perylene	< 9900	< 99000				
Benzo(a)anthracene	< 9900	< 99000				
Benzo(a)pyrene	< 9900	< 99000				
Benzo(b)fluoranthene	< 9900	< 99000				
Benzo(k)fluoranthene	< 9900	< 99000				
Benzoic Acid	< 49500	< 495000				
Benzyl Alcohol	< 19500	< 195000				
Beta-BHC	< 19500	< 195000				
Beta-endosulfan	< 19500	< 195000				
Butylbenzylphthalate	< 9900	< 99000				
Chrysene	< 9900	< 99000				
Delta-BHC	< 19500	< 195000				
Di- 'l phthalate	< 9900	< 99000				
Di- /lphthalate	< 9900	< 99000				
Dibenzo(A,H)anthracene	< 9900	< 99000				
Dibenzofuran	< 9900	< 99000				
Dieldrin	< 19500	< 195000				
Diethyl Phthalate	< 9900	< 99000				
Dimethyl Phthalate	< 9900	< 99000				
Dimethylaminoazobenzene	< 9900	< 99000				
Diphenylamine	< 9900	< 99000				
Endosulfan sulfate	< 19500	< 195000				
Endrin	< 19500	< 195000				
Endrin ketone	< 19500	< 195000				
Ethylmethanesulfonate	< 19500	< 195000				
Fluoranthene	< 9900	< 99000				
Fluorene	< 9900	< 99000				
Gamma-BHC	< 19500	< 195000				
Heptachlor	< 19500	< 195000				
Heptachlor epoxide	< 19500	< 195000				
Hexachlorobenzene	< 9900	< 99000				
Hexachlorobutadiene	< 9900	< 99000				
Hexachlorocyclopentadiene	< 9900	< 99000				
Hexachloroethane	< 9900	< 99000				
Indeno(1,2,3-CD)pyrene	< 9900	< 99000				
Isophorone	< 9900	< 99000				
Methoxychlor	< 19500	< 195000				
Methylmethanesulfonate	< 9900	< 99000				

M15 The nonaqueous liquid was digested using SW-846 Method 3030 (a sulfuric acid reflux). Reported values for barium may be biased low by up to 80%, as indicatd by QC data, due to precipitation as barium sulfate. Mercury analysis was performed on a portion of the Method 3030 digestate.

RD2 *Source of the regulatory definitions is the Resource Conservation and Recovery Act.*

S6 Reported concentrations are highly uncertain and may underestimate true values by at least a factor of two. The sample composition caused severe chemical interferences with the analysis (i.e., 0 - 50 % matrix spike recoveries).

Technical and Quality Review:

Sheila J. Sailer
Inorganic Technical Leader

Technical and Quality Review:

Not required GTB
Michael J. Connolly, Ph. D.
Organic Technical Leader

Quality Assurance Review:

Nancy Roberts
Quality Assurance Officer

Release Authorization:

Joseph T. Bennett, Ph. D.
Laboratory Manager

Customer Sample ID:	LAB BLANK	CFA680LL01				
Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Semi-volatile Organic Compounds EPA Method 8270						
N-Nitrosodibutylamine	< 9900	< 99000				
N-nitroso-di-propylamine	< 9900	< 99000				
N-nitrosodimethylamine	< 9900	< 99000				
N-nitrosodiphenylamine	< 9900	< 99000				
Naphthalene	< 9900	2478710				
Nitrobenzene	< 9900	< 99000				
P,P'-DDD	< 19500	< 195000				
P,P'-DDE	< 19500	< 195000				
P,P'-DDT	< 19500	< 195000				
Pentachlorobenzene	< 9900	< 99000				
Pentachloronitrobenzene	< 19500	< 195000				
Pentachlorophenol	< 49500	< 495000				
Phenacetin	< 19500	< 195000				
Phenanthrene	< 9900	8115 J				
Phenol	< 9900	< 99000				
Pronamide	< 9900	< 99000				
Pyrene	< 9900	< 99000				

Customer Sample ID:	LAB BLANK	CFA680LL01
Sample Type:		Liquid
Date Sampled:	/ /	05/22/89
Date Received:	/ /	05/22/89
Lab Sample ID:	VBLK0903	9MIA0903
Date Extracted:	12/12/89	12/12/89
Date Analyzed:	12/12/89	12/12/89

Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Volatile Organic Compounds EPA Method 8240						
1,1,1-Trichloroethane	< 250000	< 185185				
1,1,2,2-Tetrachloroethane	< 250000	< 185185				
1,1,2-Trichloroethane	< 250000	< 185185				
1,1-Dichloroethane	< 250000	< 185185				
1,1-Dichloroethene	< 250000	< 185185				
1,2,3-Trichloropropane	< 250000	< 185185				
1,2-Dichlorobenzene	< 500000	< 370370				
1,2-Dichloroethane	< 250000	< 185185				
1,2-Dichloroethene (total)	< 250000	< 185185				
1,2-Dichloropropane	< 250000	< 185185				
1,3-Dichlorobenzene	< 500000	< 370370				
1,4-Dichloro-2-butene	< 5000000	< 3703704				
1,4-Dichlorobenzene	< 500000	< 370370				
2-Butanone	< 5000000	< 3703704				
2-[illegible]roethyl vinyl ether	< 500000	< 370370				
[illegible]one	< 2500000	< 1851852				
4-[illegible]yl-2-Pentanone	< 2500000	< 1851852				
Acetone	< 5000000	< 3703704				
Acrolein	< 2500000	< 1851852				
Acrylonitrile	< 5000000	< 3703704				
Benzene	< 250000	1284444				
Bromodichloromethane	< 250000	< 185185				
Bromoform	< 250000	< 185185				
Bromomethane	< 500000	< 370370				
Carbon Tetrachloride	< 250000	< 185185				
Carbon disulfide	< 250000	< 185185				
Chlorobenzene	< 250000	< 185185				
Chloroethane	< 500000	< 370370				
Chloroform	< 250000	< 185185				
Chloromethane	< 500000	< 370370				
Cis-1,3-Dichloropropene	< 250000	< 185185				
Dibromochloromethane	< 250000	< 185185				
Dibromomethane	< 1000000	< 740741				
Dichlorodifluoromethane	< 1000000	< 740741				
Ethyl Methacrylate	< 250000	< 185185				
Ethylbenzene	< 250000	22125185				
Iodomethane	< 1000000	< 740741				
Methylene chloride	< 250000	45185 J				
Styrene	< 250000	< 185185				
Tetrachloroethene	< 250000	< 185185				
Toluene	< 250000	45406296				

Continued

	Customer Sample ID:	LAB BLANK	CFA680LL01				
Parameter		Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Volatile Organic Compounds EPA Method 8240							
Trans-1,3-Dichloropropene		< 250000	< 185185				
Trichloroethene		< 250000	< 185185				
Trichlorofluoromethane		< 500000	< 370370				
Vinyl Acetate		< 2500000	< 1851852				
Vinyl chloride		< 500000	< 370370				
Xylene (meta & para)		< 250000	80731852				
Xylene (ortho)		< 250000	35608519				

Legend:

PQL = Practical quantitation level. This is the lowest concentration reliably measurable (i.e., 33% maximum uncertainty in precision and accuracy at the one standard deviation confidence level) for normal samples during routine laboratory operations.

< = Less than. The value reported immediately following the less than symbol is the practical quantitation level (PQL) for the analyte. See the PQL definition for further explanation of the PQL. The reported PQL is adjusted for differences in sample weight, sample volume, sample moisture content, and analysis dilutions whenever those parameters differ from that specified for the standard analytical procedure.

Comments:

J Indicates an estimated value for target compounds (i.e., specific compounds for which the procedure was calibrated). The concentration is below the PQL, but the compound was detected in the sample. In the case of compounds which are not target compounds (i.e., tentatively identified compounds), the method is not calibrated to quantitatively measure their abundances. An estimated calibration factor is assumed to quantify these compounds, therefore the reported concentrations are estimated.

M16 Due to the sample matrix (a liquid with numerous particles), the aliquot analyzed for Volatile Organic Compounds was measured gravimetrically rather than volumetrically. For this reason, the concentration is reported in ug/kg, rather than ug/L. The concentration in terms of ug/L would be slightly higher than the ug/kg reported.

M17 Due to the sample matrix (a liquid with numerous particles), the aliquot analyzed for Semivolatile Organic Compounds was measured gravimetrically rather than volumetrically. For this reason, the concentration is reported in ug/kg, rather than ug/L. The concentration in terms of ug/L would be slightly higher than the ug/kg reported.

Technical and Quality Review:

Not required SJB

Shelly J. Sailer
Inorganic Technical Leader

Technical and Quality Review:

Michael J. Connolly, Ph.D.
Organic Technical Leader

Quality Assurance Review:

Nancy Roberts
Quality Assurance Officer

Release Authorization:

Joseph T. Bennett, Ph.D.
Laboratory Manager